NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD AND SPECIFICATIONS

RESIDUE MANAGEMENT, MULCH TILL

(Acre)
CODE 329B

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residues on the soil surface year-round while growing crops where the entire field surface is tilled prior to planting.

PURPOSES

This practice may be applied as part of a conservation system to support one or more of the following:

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or improve soil organic matter content.
- Conserve soil moisture.
- Provide food and escape cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown.

This standard includes tillage methods commonly referred to as mulch tillage or chiseling and disking. It applies to stubble mulching on summer fallow land, to tillage for annually planted crops, and to tillage for planting perennial crops.

CRITERIA

General Criteria Applicable to All Purposes

Loose residues to be retained on the field shall be uniformly distributed on the soil surface. Combines or similar machines used for harvesting shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Residues shall not be burned.

Implements shall be equipped to operate through plant residues without clogging and to maintain residue on or near the soil surface by undercutting and mixing.

Planters, drills, and other seeders shall be equipped to plant in residue distributed on or near the soil surface or mixed in the tillage layer.

The number, sequence, and timing of tillage and planting operations and the selection of ground-engaging components shall be managed to achieve the planned amount, distribution, and orientation of residue after planting or at other essential time periods. Acceptable alternative tillage sequences shall be initially determined by a residue budget using locally applicable data on residue production by crops and residue reduction by tillage operations. Adjustments shall be made as needed during the tillage sequence based on field measurements of the remaining residue.

Additional Criteria to Reduce Sheet and Rill Erosion or Wind Erosion

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective shall be determined using current approved erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount of residue needed for erosion control. Calculations shall account for the effects of other practices used in the conservation system.

Tillage operations shall be limited to methods that leave residue on the surface and maintain the planned cover conditions.

Additional Criteria to Maintain or Improve Soil Organic Matter Content

The amount of residue and the number and type of tillage operations needed to achieve the desired soil condition shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed for the desired soil condition. Calculations shall account for the effects of other practices in the conservation system.

Additional Criteria to Conserve Soil Moisture

A minimum quantity of 50 percent residue cover shall be maintained throughout the year. Residue shall be evenly distributed and maintained on the soil surface. Partial removal of residue by means such as baling or grazing shall be limited to retain the minimum amount needed to conserve soil moisture.

Additional Criteria to Provide Food and Escape Cover for Wildlife

Residue height and amount will be managed based on the food and cover required by targeted wildlife species. Residues shall not be removed unless it is determined by a habitat evaluation procedure, Wildlife Habitat Assessment Guide, that residue removal would not adversely affect habitat values. Stubble shall remain standing over winter. Tillage shall be delayed until spring to maintain waste grain on the soil surface through the winter.

CONSIDERATIONS

Excess removal of plant residue by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without a full evaluation of the impacts on soil, water, animal, plants, and air.

Mulch till may be practiced continuously throughout the crop sequence or may be managed as part of a residue management system that includes other tillage methods such as no till. Consider the effect of tillage on the amount and orientation of surface residue when selecting tillage methods.

Production of adequate amounts of crop residues necessary for the proper functioning of this practice can be enhanced by the selection of high residue crops and crop varieties in the rotation, use of cover crops, and adjustments to plant populations and row spacing.

When improvement of soil tilth is a concern, use of undercutting implements will enhance the accumulation of organic material in the surface layer.

Chaff spreaders and straw choppers and spreaders are a valuable attachment for all combines particularly when harvesting high yielding crops. When combines are equipped with a stripper header, only a chaff spreader is desired.

The effectiveness of stubble to trap snow or reduce plant damage from freezing or desiccation increases with stubble height. A minimum stubble height of 6 inches is desired. Patterns of variable stubble heights may be created to further increase snow storage.

Leaving rows of unharvested crop standing at intervals across the field can enhance the value of residues for wildlife habitat.

PLANS AND SPECIFICATIONS

Site specifications for establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard.

Site specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

No specific operation and maintenance requirements have been identified for this practice.

GENERAL SPECIFICATIONS

Procedures, technical details, and other information listed below provide additional guidance for carrying out selected components of this practice.

The estimated residue cover after harvest shall be:

Corn, 30” rows, >120 bushel yield	95%
Corn, 30” rows, 60-120 bushel yield	80%
Corn, silage, 23 ton yield	15%
Cotton	35%
Forage crop, after cutting	35%
Forage crop, after regrowth	85%
Grain sorghum, harvested for grain	75%
Grain sorghum, silage	15%
Winter small grain, 50 bushel yield	85%
Spring small grain, 40 bushel yield	80%
Soybeans, 30” rows, 35 bushel yield	70%
Soybeans, drilled, 40 bushel yield	75%
Sunflowers, 1400 pounds yield	40%
Rice	60%

Estimates of residue cover remaining after grazing, over winter weathering, tilling, or planting operations shall be determined according to the guidelines in the National Agronomy Manual, Part 503, Subpart E.

The line transect method shall be the approved method used to evaluate the percentage of ground surface actually covered by plant residue.

REFERENCES

Conservation Tillage Systems and Management, MWPS-45 Second Edition, 2000.